

CLAIMS

We claim:

1. A homogeneous fixed abrasive polishing article comprising:
  - a) a matrix formed of a cured resin coated talc material and having at least one working surface; and
  - b) an abrasive uniformly distributed throughout the matrix.
2. The polishing article of claim 1 wherein the abrasive comprises ceria.
3. The polishing article of claim 1 further comprising an optically transparent portion.
4. A homogeneous fixed abrasive polishing article comprising:
  - a) a filler material having a hardness less than 3 on the Mohs hardness scale;
  - b) an abrasive uniformly distributed throughout the filler material; and
  - c) a plurality of conduits through the polishing article adapted for delivering a fluid through the polishing article.
5. The polishing article of claim 4 wherein the filler material comprises talc.
6. The polishing article of claim 4 wherein the abrasive comprises ceria.
7. The polishing article of claim 4 further comprising at least one optically transparent window adapted to allow for transmission of light through the polishing article.
8. A homogeneous fixed abrasive polishing article comprising:
  - a) a matrix comprised substantially of a filler material having a hardness less than 3 on the Mohs hardness scale, wherein the matrix has at least one substantially planar working surface;
  - b) an abrasive uniformly distributed throughout the matrix; and

- c) a plurality of grooves created in the working surface for the transportation of fluids over the working surface.

9. The polishing article of claim 8 wherein the filler material comprises talc.

10. The polishing article of claim 8 wherein the abrasive comprises ceria.

11. The polishing article of claim 8 further comprising an optically transparent window portion.

12. A method for manufacturing a homogeneous fixed abrasive polishing article having a working surface, comprising the steps of:

- a) mixing a binder, a solvent and a filler material together, wherein the filler material has a hardness less than 3 on the Mohs hardness scale, thereby creating a resin coated filler material;
- b) drying the resin coated filler material;
- c) grinding the resin coated filler material;
- d) sieving the resin coated filler material;
- e) mixing an abrasive material with the resin coated filler material;
- f) sieving the abrasive material and the resin coated filler material thereby creating a powder material;
- g) transferring the powder material to a mold wherein the mold has at least one substantially planar surface to form a working surface for the polishing article;
- h) compressing the powder material; and
- i) curing the powder material.

13. The method of claim 12 further comprising the steps of:

- j) removing the cured powder material from the mold; and
- k) preparing the cured powder material for use on a chemical mechanical planarization tool.

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14. The method of claim 12 wherein the filler material comprises talc.
15. The method of claim 12 wherein the abrasive is ceria.
16. The method of claim 13 further comprising the step of:
  - 1) creating a plurality of conduits through the cured powder material to facilitate the distribution of fluids through the polishing article to the working surface.
17. The method of claim 13 further comprising the step of:
  - 1) creating a plurality of grooves in the working surface of the polishing article.
18. The method of claim 17 wherein the grooves are formed in the working surface of the polishing article after curing.
19. The method of claim 17 wherein the grooves are formed as a result of the shape of the mold during the curing step.
20. A method for manufacturing a homogeneous fixed abrasive polishing article having a working surface, comprising the steps of:
  - a) mixing a binder, a solvent, an abrasive material and a filler material together, wherein the filler material has a hardness less than 3 on the Mohs hardness scale, thereby creating a resin coated abrasive-filler material;
  - b) drying the resin coated abrasive-filler material;
  - c) grinding the resin coated abrasive-filler material;
  - d) sieving the resin coated abrasive-filler material thereby creating a powder material;
  - e) compressing the powder material in a mold; and
  - f) curing the powder material.
21. The method of claim 20 further comprising the steps of:

- g) removing the cured powder material from the mold; and
- h) preparing the cured powder material for use on a chemical mechanical planarization tool.

22. The method of claim 20 wherein the filler material comprises talc.

23. The method of claim 20 wherein the abrasive is ceria.

24. The method of claim 21 further comprising the step of:

- i) creating a plurality of conduits through the polishing article to facilitate the distribution of fluids through the polishing article to the working surface.

25. The method of claim 21 further comprising the step of:

- i) creating a plurality of grooves in the working surface of the polishing article.

26. The method of claim 25 wherein the grooves are cut into the working surface of the polishing article after the curing step.

27. The method of claim 25 wherein the grooves are formed as a result of the shape of the mold during the curing step.

28. The method of claim 21 wherein the step of curing the powder comprises applying heat.

29. The method of claim 28 wherein the step of curing the powder material by applying heat is performed simultaneously with the step of compressing the powder material.